Wetland restoration in the Zahorie lowland, Slovakia

Year of issue

2025

Summary

WETREST (LIFE05 NAT/SK/000112) in the Záhorie Lowland (western Slovakia) focused on wetland restoration and public awareness, funded by the LIFE programme together with the Ministry of Environment. Implemented by the State Nature Conservancy with SVP and BROZ (2005–2008), it improved hydrology across eight Natura 2000 sites. A fish pass was built on the Rudava at Veľké Leváre to re-establish fish migration.

Since then, restoration has continued: in 2022 BROZ and partners re-naturalised ~2.2 km of the lower Rudava near Veľké Leváre under the Interreg Alpine–Carpathian River Corridor, removing concrete lining and re-meandering the channel; the river became ~180 m longer, with works completed on 22 Sept 2022.

New actions under LIFE-IP Natura 2000 SK (2024–2025) will block ~10 km of drainage ditches with 366 small dams, create ~10 ha of wetlands, and repair two sluices in the Rudava and Kaltenbruk sites to retain water and support priority species. Complementary efforts in the Morava floodplain near Malé Leváre (2022–2024), led by Green Foundation with BROZ and NINA, targeted the restoration of at least 210,000 m² of degraded wetlands and awareness-raising.

Photo Gallery



Location

48.5028, 17.0018

Project

NWRM

National ID

Slovakia_03

Sector

Hydromorphology

Installation Date

2008-12

Implementation status

Ongoing

Contact

REC

Overview

Location of the project

The case study covers several Natura 2000 wetland sites in the Záhorie Lowland (Borská nížina), around Lakšárska Nová Ves and Šaštín-Stráže

Country

Slovakia

NUTS2 Code

Západné Slovensko

Sponge measures implemented in the case study

Wetland restoration and management

Re-meandering

Objectives

Restore the water regime and improve the conservation status of wetland habitats across eight Natura 2000 sites in the Záhorie Lowland.
Contribute to establishing the Natura 2000 network in Záhorie (project area comprising 8 SCIs, 17 Habitats of Community Interest, 6 Habitats of National Interest).
Build a fish bypass on the Rudava River near Veľké Leváre to re-enable fish migration.
Restore species-rich lowland meadows in the Rudava floodplain.
Prepare a Management Plan for each project site (and a technical Revitalisation Project where needed).
Raise public awareness (media outreach, information/education materials, talks, excursions, on-site information boards) and strengthen partners' technical capacities.

Involved partners

Authority type	Authority name	Authority role	Authority responsibility

National water authority	State Nature Conservancy of the Slovak Republic	Implementation	Supporting
National water authority	Slovak Water Management Enterprise, Department Bratislava	Implementation	Responsible
NGO	BROZ- Regional Association for Nature Conservation and Sustainable Development	Implementation	Responsible
Local water authority	SNC- Administration of Zahorie PLA	Implementation	Supporting

Site Information

Climate Zone

Warm temperate dry

Precipitation

580.00 mm

Temperature (°C)

9.50 °C

Runoff coefficient

0.20

Elevation range

173

Vegetation class

Alluvial forests with Alnus glutinosa and Fraxinus excelsior

WFD Ecological status

Moderate

WFD Chemical status

Failing to achieve good

Design and Implementation

Project scale

Meso

Project scale specifications

This restoration covered multiple Natura 2000 wetland sites across the Záhorie Lowland (regional/sub-basin scope) under LIFE WETREST, and included reach-scale works on the Rudava River near Veľké Leváre (later re-naturalised over ≈2.2 km), with follow-on actions continuing in the Záhorie region under LIFE-IP Natura 2000.

Area subject to Land use change or Management/Practice change (ha)

165.00 ha

Financing

Total cost

728912.00 €

Costs other information

LIFE WETREST (2005–2008, LIFE05NAT/SK/000112)
Planned budget €624,000; actual costs €728,912; EU LIFE co-financing rate 50%

LIFE-IP NATURA 2000 SK (2021–2030) – the integrated programme under which new Rudava/Kaltenbruk actions (ditch blocking, wetland creation) are planned: total eligible budget €16,622,242; EC LIFE contribution €9,973,345 (60%) (programme-wide; not site-specific).

Financing authorities

Authority name	Type of funding	Financing share
European Union	EU-funds: LIFE+	50 %
—	Private funds	—

Compensations

Non

Policy and Governance

Policy description

During the preceding two decades, the total wetland area in Slovakia had declined dramatically and the vast majority of remaining natural and semi-natural wetlands were seriously threatened by human activities. The main cause of the decline were changes in the natural water regime, brought about by extensive drainage, peat extraction and land-reclamation schemes - mostly to provide more agricultural land, but also as part of intensification of forest management.
The changes had led to a decline in habitats and species associated with the wetlands and a reduction of the retention capacity of the areas concerned. Many species that were once common - such as amphibians or storks - had become rare, some of them even locally extinct. One of the most valuable remaining wetlands is located in the Zahorie Lowland, which is also one of the most important regions in Slovakia for biodiversity in general.

Land ownership

State-owned and managed for the Ministry of Defence by the state enterprise Vojenské lesy a majetky SR (VLM SR).

Policy targets

Improved Biodiversity

Part of a wider plan

Non

Public consultation

Oui

Consultation activities

Activity type	Comments
Training courses	with 26 and 19 participants
Study visits	four study visits with around a dozen participants each were organised for project personnel, as well as five additional short study visits with just two or three key personnel at a time
Informative deliverables	information in various printed and electronic formats as well as erecting information posts and engaging actively with the media to build public support for the protection of the sites
Public events and meetings	—

Has contractual arrangements

Non

Impacts and Monitoring

Monitoring System

Monitoring requirements

Monitoring is carried out by the State Nature Conservancy (CHKO Záhorie) with the Slovak Angling Association and research partners (e.g., VÚVH/STU)

Monitoring parameters

Post-restoration fish community surveys with basic physico-chemical measurements, hydromorphological and macroinvertebrate surveys, and functional checks of the Veľké Leváre fish pass.

Maintenance

Maintenance requirements

Focuses on vegetation and water-regime operations in the Natura 2000 areas - removing shrubs/trees, creating/maintaining grazed grasslands, and restoring/operating water-control infrastructure (ditch blocks and two sluices).

Socio-economic Impacts

Benefits and co-benefits

WETREST explicitly targeted awareness-raising (information/education actions). Later, BROZ mounted a public exhibition on rivers and migration corridors in Veľké Leváre under the Alpine–Carpathian River Corridor project. In Malé Leváre (Morava floodplain, adjacent to the Rudava mouth), the Norway-Grants project “Mokrade pre život a prosperitu” delivered restoration plus an educational wetland trail adapted for children with ASD, combining habitat work with outreach.
Large parts of the area sit in the Záhorie Military District; since 2012 general entry is allowed without individual permits, but temporary closures and permanently restricted sub-zones still apply—this regulates public access to restored sites.

Biophysical impacts: Hydrology

Information on retained water

Rudava re-meandering (2022): 2.2 km of straightened channel restored; 82 new meanders created; river length +180 m; 4,540 t of concrete removed. These are physical changes relevant to flow diversity and storage, but no quantified flood-attenuation or storage volumes were reported.

Biophysical impacts: Biodiversity

Improved biodiversity

Oui

Information on improved biodiversity

Fish community response (post-restoration survey, 2022): 19 fish species recorded; on the restored reach, abundance >3× and biomass ~1.5× higher vs. pre-restoration; appearance of several protected species (e.g., Rhodeus amarus, Cobitis elongatoides) not present when the reach was regulated. Negative/unexpected: higher occurrence of invasive round goby (Neogobius melanostomus) noted.

Lessons Learned

Key lessons

A successful project is an integrated project. Public awareness campaigns on the importance of wetlands and restoration and conservation is a key factor in order to keep good results.

Restoration at Rudava shows that physically de-canalising a lined river can rapidly restart natural processes: 2.2 km were re-meandered, 4,540 t of concrete removed, 82 new bends cut, and the channel lengthened by ~180 m. Early biological monitoring reported a strong fish response.
Permitting and legislation are as decisive as engineering. This “first-of-its-kind” Slovak revitalisation faced an unusually long preparation and a heavy consent load (26 institutional consents; 67 permit conditions), highlighting the need to streamline procedures for nature-positive river works.

Cross-sector partnerships made the build feasible: the NGO (BROZ), water authority (SVP), State Nature Conservancy (ŠOP SR), and research bodies (VÚVH, STU) co-designed and executed the works, with Interreg SK-AT backing.

Sequencing matters. Earlier WETREST actions (incl. a fish bypass at Veľké Leváre) and meadow restoration laid ecological groundwork; subsequent reach-scale re-naturalisation and the ongoing LIFE-IP ditch-blocking/wetland creation extend hydrological and habitat gains across the Záhorie lowland.

Gains can come with caveats: alongside protected species returning, invasive round goby increased on the restored reach—underscoring the need for continued monitoring and adaptive management.

Barriers

Barrier type	Barrier role	Comments

Legal obligations / restrictions	Main barrier	At the same time, further threats to the vulnerable habitats from policies in areas of forestry, hunting and tourism are increasing.
Legal obligations / restrictions	Secondary barrier	Complex, time-consuming permitting and legislative gaps (revitalisation treated as a “water structure” → 26 consents, 67 conditions). Long lead time before works (≈1,095 days from first survey to start), reflecting administrative and technical hurdles.
Attitude of relevant stakeholders	Secondary barrier	Need to coordinate many actors across borders and sectors (NGO, agencies, research, Interreg governance).

Success factors

Success factor type	Success factor role	Comments
Successful coordination between authorities	Main factor	Strong, complementary partnership (BROZ–ŠOP SR–SVP–VÚVH–STU) embedded in the regional CHKO Záhorie context.
Successful coordination between authorities	Main factor	Continuity across programmes (LIFE WETREST → Interreg ACRC → LIFE-IP N2000) sustaining actions over time.

Transferability

Highly transferable to lowland, channelised rivers and drained floodplains. Success hinges on cross-agency partnerships and sustained funding, plus careful permitting/land-tenure checks. Diagnose hydromorphology and groundwater before design; manage fish passage and ditch-blocking; plan for invasive species, sediment remobilisation and temporary access restrictions; and embed post-works monitoring for adaptive management.

Sources

Sources

WETREST - Restoration of Wetlands at Zahorie Lowland

Restoration at Zahorie Lowland

Revitalizácia Rudavy v číslach

Monitoring ichtyofauny na rieke Rudava s ohľadom na revitalizáciu toku

Obnova mokradí Záhorskej nížiny

Obnova mokradí Záhorskej nížiny / Restoration of Wetlands at Zahorie Lowland

Program LIFE – Príroda prispieva k obnove vzácnych mokradí. NATURA 2000 – posledná divočina na Záhorí

Územia európskeho významu vo Vojenskom výcvikovom priestore Záhorie (Chránené územia Slovenska 97 – p. 62)

PR Jasenácke

Keď Morave nepomôžeme, môžeme stratiť vzácne územie, mokrade a lužné lesy, hovorí riaditeľ CHKO Záhorie T. Olšovský